

LECTOTYPIFICATION OF *GAULTHERIA PYROLIFOLIA* AND *G. PYROLOIDES* (ERICACEAE)

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ABSTRACT

Different names have been used for two eastern Asian and Alaskan species of *Gaultheria* in various taxonomic treatments. To resolve this problem, a lectotype for the name *G. pyroloides* is selected. The name *G. miqueliana*, employed in most taxonomic works for the species from Japan, Russia, and Alaska since its publication in 1918, must be relegated to synonymy under *G. pyroloides*. A lectotype is also selected for the Himalayan species *G. pyrolifolia*. Several morphological characters are identified that differentiate the two species.

RESUMEN

Se han usado diferentes nombres para dos especies, del este de Asia Alaska, de *Gaultheria* en varios tratamientos taxonómicos. Para resolver este problema, se ha seleccionado un lectotipo para el nombre *G. pyroloides*. El nombre *G. miqueliana*, empleado en la mayoría de los trabajos taxonómicos para la especie de Japón, Rusia, y Alaska desde su publicación in 1918, debe ser relegado a la sinonimia de *G. pyroloides*. Se ha seleccionado también un lectotipo para la especie del Himalaya *G. pyrolifolia*. Se han identificado varios caracteres morfológicos que diferencian las dos especies.

During preparation of manuscripts on the taxonomy of *Gaultheria* for a treatment of the genus in Gaoligong Shan, western Yunnan Province, China (Fritsch) and for Flora of North America (Trock), the authors detected inconsistency in the application of the names *G. miqueliana* Takeda, *G. pyrolifolia* J.D. Hooker ex C.B. Clarke, and *G. pyroloides* Miquel to two species from eastern Asia and the Aleutian Islands. Here we clarify the nomenclature of these species by designating lectotypes for *G. pyrolifolia* and *G. pyroloides*.

Nomenclatural Background of *Gaultheria pyroloides* and *G. pyrolifolia*

Gaultheria pyroloides was described on the basis of several gatherings from Sikkim by John Dalton Hooker (s.n.), two of which are now on the same sheet at K but were possibly separate when Miquel saw the material (Fig. 1), and one from Japan (collector not determined; Fig. 2). In the protologue, Miquel (1863) indicated that he considered these specimens to represent one and the same species, as evidenced by the following statement: “Specimina nostra capsulifera ab indices, quae in regione alpina 12–13,000 alt. Himalayae Sikkimensis detecta et e Museo Kewensi mihi concessa, floribusque instructa sunt, nullo modo differunt,” which in English translates roughly to “Our [Japanese] capsuliferous specimen in no way differs from that from the index, which, found in the alpine region of the Sikkim Himalaya between 12,000 and 13,000 feet elevation and given to me from the Museum at Kew, is provided with flowers.” The description seems to be based solely or in large part on the Japanese specimen, because only the fruiting condition is described and flower characters are not included. This suggests that Miquel did not have direct access to the Sikkim specimens at the time of description and was relying at least in part on memory in his decision to include the Sikkim and Japanese plants under the same species. Perhaps a memory lapse, then, explains why Miquel ascribed the name *G. pyroloides* to “Hook. fl. et Th. herb. Ind. or.” (i.e., J.D. Hooker and T. Thomson) when “*G. pyrolaefolia* H f & T” in Hooker’s handwriting [as confirmed with the examples in Burdet (1975)] is written on the Hooker and Thomson sheet, and not “*G. pyroloides*.”

Subsequently, C.B. Clarke [in Hooker (1882)] described *Gaultheria pyrolifolia* (as *G. “pyrolaefolia”*) based on several gatherings of Hooker (ascribing the name to “Hook. f. ms.”), including those seen by Miquel. Clarke appears to have been unaware that *G. pyroloides* was already published or at least that it was based on a

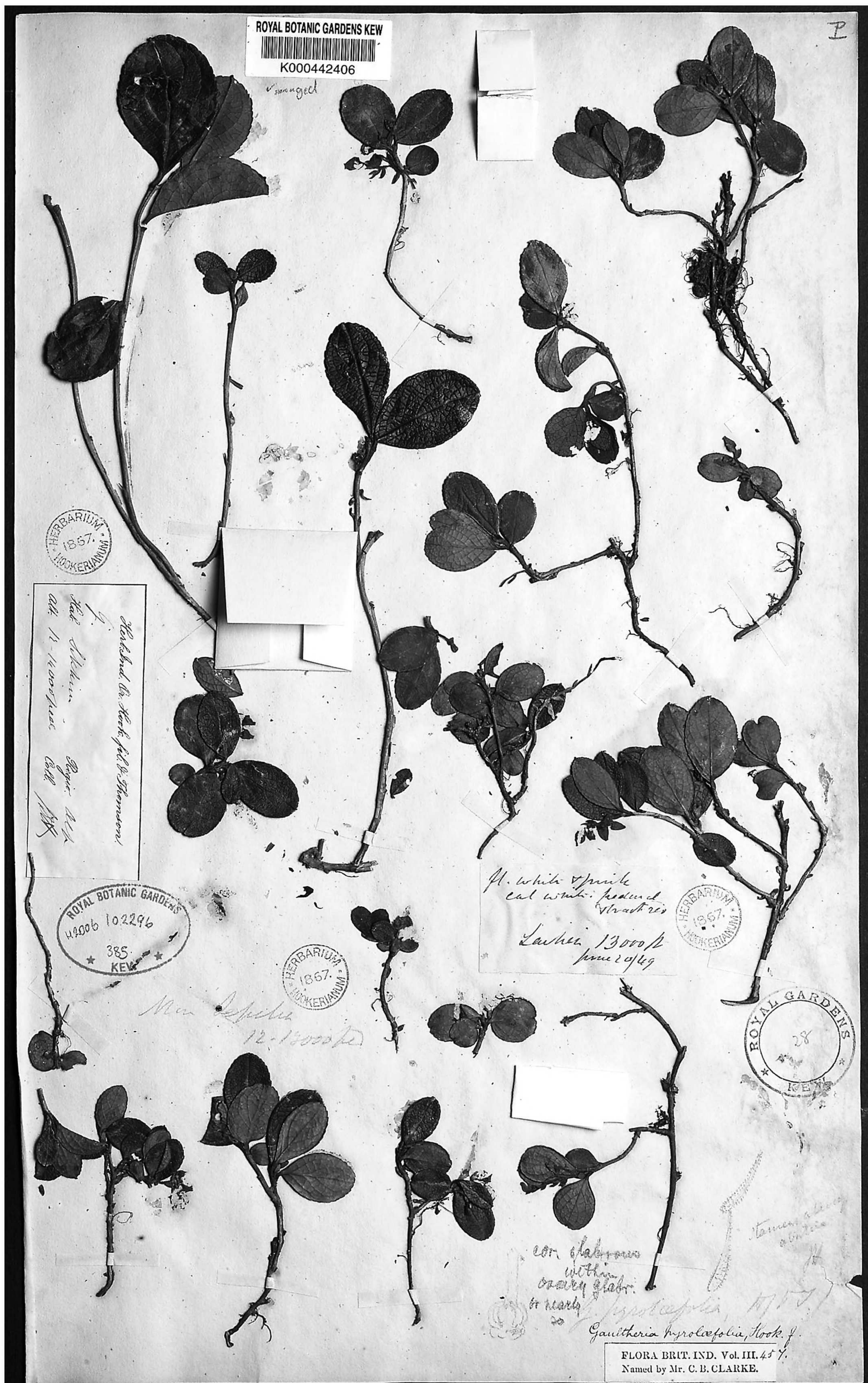


FIG. 1. Image of the lectotype (K) of *Gaultheria pyrolifolia* J.D. Hooker ex C.B. Clarke from Sikkim. The specimens from Lachen constitute the lectotype, although it is unclear precisely which individual fragments were collected from there versus Mt. Lepcha.

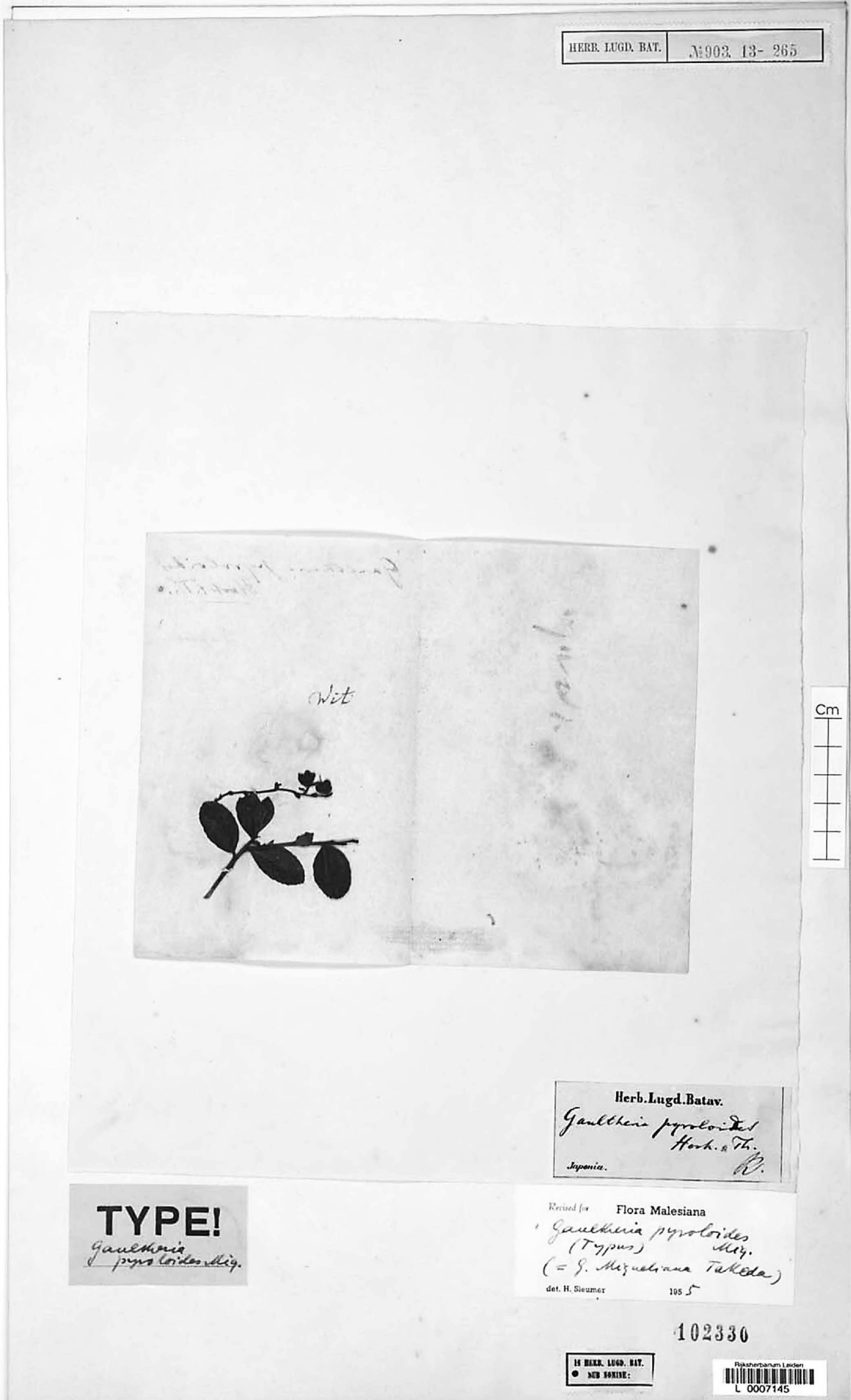


FIG. 2. Image of the lectotype (L) of *Gaultheria pyroloides* Miquel from Hokkaido, Japan.

Himalayan specimen in addition to one from Japan, because mention is made neither of it nor any other potentially confounding nomenclatural issues in the protologue.

If the specimens under consideration were one and the same species, then one might argue that the only nomenclatural issue of consequence involves the orthographic similarity between the epithets “*pyrolifolia*” and “*pyroloides*.” Article 60.3 of the International Code of Botanical Nomenclature (ICBN; McNeill et al. 2006) states, however, that “The liberty of correcting a name is to be used with reserve....” Because the meanings of the epithets “*pyrolifolia*” and “*pyroloides*” are distinctly different [“*Pyrola*-leaved” versus “resembling *Pyrola*” (the whole plant), respectively], the names are not justifiably considered as orthographic variants.

Morphological Distinctness of the Himalayan and Japanese Plants

The most recent comprehensive treatments of eastern Asian *Gaultheria* [i.e., those of Airy Shaw (1941) and Middleton (1991)] have followed Takeda (1918) in recognizing two species constituting the type material of *G. pyroloides*, as justified by the bluish black versus white fruiting calyx observed in Himalayan and Japanese specimens, respectively (Takeda 1918). The other difference between the two species cited by Takeda (“2-aristate anther” versus “4-aristate anther”) is incorrect and undoubtedly resulted from a misreading of the original description of *G. pyrolifolia*, which states “anther-cells 2-horned at apex.” In fact both species of *Gaultheria* have 4-aristate anthers when these are functional (i.e., as opposed to the highly reduced anthers of female flowers, as observed by us on specimens from the Himalaya). The use of a single character to distinguish species should be questioned, and to our knowledge the differences between these species have not been documented since Takeda (1918). By examining herbarium material of both species from A, BM, E, GH, K, KUN, and S, we have observed other features that further distinguish the bluish black-fruited species from the white-fruited species: leaves adaxially glabrous versus densely puberulent along midvein, bracteoles ovate versus oblanceolate, flowers 4–5 mm versus 5–6 mm long, and style 2–2.5 mm versus 3–3.5 mm long. The bluish black-fruited species is distributed in the eastern Himalaya from Sikkim (India) to northwestern Yunnan (China); the white-fruited species is distributed from central Honshu (Japan) to Sakhalin Island and Kunashir Island, Siberia (Russia) with an isolated population on Kiska Island, Alaska (U.S.A.).

Nomenclatural Resolution

In an apparent attempt to solve the nomenclatural problem of two species comprising the original material of the same name, Takeda (1918) gave the new name *G. miqueliana* Takeda to the Japanese plant (as he saw it, the epithets “*pyrolifolia*” and “*pyroloides*” were equivalent). Inexplicably, however, *G. pyroloides* was cited in synonymy, and Takeda did not designate a type for *G. miqueliana*. The only reference to the original material seen by Miquel was implied by the exclusion of the Hooker material from *G. pyroloides* [“*SYN. Gaultheria pyroloides* Miq. in Ann. Mus. Lug.-Bat. i, p. 30 (1863–64)....nec Hook. f. et Thoms.”]. Because *G. pyroloides* was included in the synonymy of *G. miqueliana* and the type of *G. pyroloides* (at that time undesignated) neither explicitly nor implicitly excluded, *G. miqueliana* was nomenclaturally superfluous when published and is therefore illegitimate.

Airy Shaw (1941) later attempted to solve the problem. He asserted that the name *Gaultheria pyroloides* should be credited to Miquel and can legitimately be used for the Japanese species, and he thereby used the name “*G. pyrolaefolia* Hook. et Thoms. [sic]” for the blue-fruited species and *G. pyroloides* Miq. for the white-fruited species. Because Airy Shaw did not clearly indicate the lectotype with the word “type” or equivalent in accordance with Article 7.11 of the ICBN (McNeill et al. 2006), he did not lectotypify the names. Neither apparently did Hermann Sleumer, who annotated the specimen during a revision of the genus for *Flora Malesiana* in accordance with Airy Shaw’s opinion (Fig. 2), but whose treatment (Sleumer 1967) makes no mention of the issue. This is not surprising in that neither species occurs in Malesia.

Authors of major taxonomic treatments of *Gaultheria* that include Japan, Russia, or Alaska have not taken up Airy Shaw’s opinion; rather, they have consistently treated the white-fruited species as *G. miqueliana* (e.g., Ohwi 1965; Bush 1967; Hultén 1968; Middleton 1991; Yamazaki 1993). Most authors of treatments of

Gaultheria that include the Himalayan region have treated the bluish black-fruited species as *G. pyroloides* (e.g., Hara 1966, 1982; Fang et al. 1986; Hsu 1991; Long & Rae 1991; Middleton 1991), the only exception being Fang & Stevens (2005), who follow Airy Shaw (1941) by using *G. pyrolifolia*. Lectotypification is required to clarify the application of names regarding these two species.

1. *Gaultheria pyroloides* Miquel, Ann. Mus. Bot. Lugduno-Batavi 1:30. 1863. (**Fig. 2**). *Gaultheria miqueliana* TAKEDA, BOT. MAG. (TOKYO) 32:195. 1918 (NOM. ILLEG. SUPERFL.). TYPE: JAPAN. “In insula Ieso” (Hokkaido) [protologue], collector undetermined [LECTOTYPE designated here: L 102330 (Herb. Lugd. Bat. No. 903, 13-265; image)].

We have lectotypified *Gaultheria pyroloides* on the Japanese specimen because 1) *G. pyrolifolia* was described by Clarke on the basis of the Sikkim specimens (Hooker 1882) and thus there is a legitimately published name clearly available for it; 2) the original description of *G. pyroloides* is based mainly or entirely on the Japanese specimen and published as part of a treatise on the flora of Japan; and 3) the alternative of lectotypifying *G. pyroloides* on the Sikkim specimen (with *G. pyrolifolia* as a taxonomic synonym) would prompt the need for a new name for the Japanese species.

2. *Gaultheria pyrolifolia* J.D. Hooker ex C.B. Clarke in J.D. Hooker, Fl. Brit. India 3:457. 1882 [“*pyrolae-folia*”]. (**Fig. 1**). TYPE: INDIA. SIKKIM: Lachen, 13,000 ft elev., 20 Jun 1849, J.D. Hooker s.n. (LECTOTYPE designated here: K image catalogue number K000442406; probable duplicates: E, GH, NY-image, P).

The protologue of *Gaultheria pyrolifolia* cites the following gatherings, the specimens of which must be considered syntypes: “Lachen, J.D.H.; Mon Lepcha and Jongri, J.D.H., Clarke.” Because we have not been able to examine Clarke’s material (probably at BM), we have chosen to lectotypify on the Hooker material. We specifically have lectotypified on the K sheet, on which Hooker’s handwriting is apparent, as follows. Two localities are indicated on this sheet: “Lachen, 13000 ft”, on what appears to be a field label, and “Mon Lepcha 12–14000 ft”, handwritten directly on the sheet. Even though the material is now placed on the same sheet (we consider a third label on which is printed and handwritten “Herb. Ind. Or. Hook. fil. & Thomson” / “G.” [*Gaultheria*] / “Hab. Sikkim” “Regio. Alp” / “Alt. 12–14000 ped” “Coll. JDH” to be a general label that refers to the whole sheet), from Hooker’s journals (1854) it is clear that it represents two gatherings, made at different times (January 1849 versus June 1849) from distinct places (about 60 km apart).

In accordance with Article 8.2 of the ICBN (McNeill et al. 2006) requiring a type to comprise a single gathering, we have chosen the Lachen specimens on the sheet as the lectotype. The Lachen specimens were chosen over those from Mt. Lepcha because they are in closest proximity to both Hooker’s handwritten note “*G. pyrolae-folia* H f & T” and an illustration accompanied by Hooker’s initials of an abortive stamen, the flowers from which are placed among the specimens nearest the Lachen label. We do so with the caveat that it is unclear precisely which specimens on the sheet correspond to the Lachen gathering; we assume that at least some of the specimens directly adjacent to the label belong to this gathering and thus constitute the lectotype. Accordingly, the E, GH, NY, and P specimens must be treated as only probable duplicates, because there appears to be no way of knowing whether the material on those sheets is from Lachen, Mt. Lepcha, or both.

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